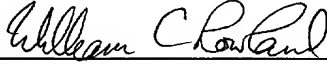


FORM-PTO-1390 (Rev. 9-2001)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER	
<b>TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371</b>				000515-280	
				U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5)	
INTERNATIONAL APPLICATION NO. PCT/SE00/01405		INTERNATIONAL FILING DATE 03 July 2000		PRIORITY DATE CLAIMED 09 July 1999	
TITLE OF INVENTION A MATERIAL LAMINATE FOR USE AS A COVERING SHEET IN AN ABSORBENT ARTICLE					
APPLICANT(S) FOR DO/EO/US Bror-Inge HELMFRIDSSON; Urban NILSSON; and Stefan LINDGREN					
<p>Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:</p> <ol style="list-style-type: none"> <li>1. <input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under <u>35 U.S.C. 371</u>.</li> <li>2. <input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li>3. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.</li> <li>4. <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31).</li> <li>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))               <ol style="list-style-type: none"> <li>a. <input checked="" type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau).</li> <li>b. <input checked="" type="checkbox"/> has been communicated by the International Bureau.</li> <li>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</li> </ol> </li> <li>6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2))               <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> is attached hereto.</li> <li>b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4).</li> </ol> </li> <li>7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))               <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau).</li> <li>b. <input type="checkbox"/> have been communicated by the International Bureau.</li> <li>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</li> <li>d. <input checked="" type="checkbox"/> have not been made and will not be made.</li> </ol> </li> <li>8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</li> <li>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). (<b>unexecuted</b>)</li> <li>10. <input type="checkbox"/> An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</li> </ol> <p><b>Items 11 to 20 below concern document(s) or information included:</b></p> <ol style="list-style-type: none"> <li>11. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</li> <li>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</li> <li>13. <input checked="" type="checkbox"/> A <b>FIRST</b> preliminary amendment.</li> <li>14. <input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.</li> <li>15. <input type="checkbox"/> A substitute specification.</li> <li>16. <input type="checkbox"/> A change of power of attorney and/or address letter.</li> <li>17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.</li> <li>18. <input checked="" type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4).</li> <li>19. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).</li> <li>20. <input checked="" type="checkbox"/> Other items or information: Written Opinion, Response to Written Opinion, International Preliminary Examination Report and International Search Report</li> </ol>					



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U.S. APPLICATION NO. (if known, see 37 CFR 1.51) <b>10/019955</b>		INTERNATIONAL APPLICATION NO PCT/SE00/01405		ATTORNEY'S DOCKET NUMBER 000515-280	
21. <input checked="" type="checkbox"/> The following fees are submitted:				CALCULATIONS	PTO USE ONLY
<b>Basic National Fee (37 CFR 1.492(a)(1)-(5)):</b> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO ..... \$1,040.00 (960) International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO ..... \$890.00 (970) International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$740.00 (958) International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... \$710.00 (956) International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$100.00 (962)					
<b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>				\$ 1040.00	
Surcharge of \$130.00 (154) for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492(e)). 20 <input type="checkbox"/> 30 <input type="checkbox"/>				\$	
Claims	Number Filed	Number Extra	Rate		
Total Claims	13 -20 =	0	X\$18.00 (966)	\$	
Independent Claims	2 -3 =	0	X\$84.00 (964)	\$	
Multiple dependent claim(s) (if applicable)			+ \$280.00 (968)	\$	
<b>TOTAL OF ABOVE CALCULATIONS =</b>				\$ 1040.00	
Reduction for 1/2 for filing by small entity, if applicable (see below).				+	\$ -
<b>SUBTOTAL =</b>				\$ 1040.00	
Processing fee of \$130.00 (156) for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492(f)). 20 <input type="checkbox"/> 30 <input type="checkbox"/>				\$	
<b>TOTAL NATIONAL FEE =</b>				\$ 1040.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 (581) per property				+	\$
<b>TOTAL FEES ENCLOSED =</b>				\$ 1040.00	
				<b>Amount to be refunded:</b>	\$
				<b>charged:</b>	\$
a. <input type="checkbox"/> Small entity status is hereby claimed. b. <input checked="" type="checkbox"/> A check in the amount of \$ <u>1040.00</u> to cover the above fees is enclosed. c. <input type="checkbox"/> Please charge my Deposit Account No. <u>02-4800</u> in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed. d. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>02-4800</u> . A duplicate copy of this sheet is enclosed. <b>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</b>					
SEND ALL CORRESPONDENCE TO: Ronald L. Grudziecki BURNS, DOANE, SWECKER & MATHIS, L.L.P. P.O. Box 1404 Alexandria, Virginia 22313-1404 (703) 836-6620					
				 SIGNATURE William C. Rowland NAME 30,888 REGISTRATION NUMBER	
				January 7, 2002 DATE	

Patent  
Attorney's Docket No. 000515-280

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of	)	
	)	
Bror-Inge HELMFRIDSSON et al.	)	Group Art Unit: Unassigned
	)	
Application No.: Unassigned	)	Examiner: Unassigned
	)	
Filed: January 7, 2002	)	
	)	
For: A MATERIAL LAMINATE FOR	)	
USE AS A COVERING SHEET IN	)	
AN ABSORBENT ARTICLE	)	
	)	
	)	

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to examination of the above-identified application, please enter the following amendment.

**IN THE CLAIMS:**

Please amend claims 1-11 as follows:

1. (Amended) A material laminate for use as a covering sheet for an absorbent article with a length direction, a width direction and a thickness direction and exhibiting a central axis extending in the length direction and two opposing side edges extending in the length direction and comprising, in the thickness direction, a first fluid pervious material layer and a second fluid pervious porous material layer wherein at least one of the material layers comprises a thermoplastic material and wherein the two material

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layers are mutually connected by bond sites in the material laminate, within which bond sites the thermoplastic material has been caused to at least partially soften or melt and thereby bond the two material layers together, and wherein the material laminate includes two side portions extending in the length direction and each extending a distance in the width direction from a respective one of the side edges towards the longitudinal central axis of the material laminate and a central portion positioned between the side portions in the width extension of the material laminate wherein the first material layer and the second material layer in the central portion of the material laminate are intermittently bonded together in a first bond pattern and the first material layer and the second material layer in the two side portions of the material laminate are intermittently bonded together in a second bond pattern wherein the first fluid pervious material layer is a fibrous layer arranged so that an outside surface of the material laminate is fibrous and the percentage of bonded area in relation to the total area in the two side portions is greater than the percentage of bonded area in relation to the total area of the central portion.

2. (Amended) A material laminate in accordance with claim 1, wherein the proportion of bonded area in relation to the total area in the central portion is at least 0.5% less than the proportion of bonded area in relation to the total area in the side portions.

3. (Amended) A material laminate in accordance with claim 1, wherein the proportion of bonded area in relation to the total area in the central portion is between 3%

and 6% and the proportion of bonded area in relation to the total area in the side portions is between 5% and 8%.

4. (Amended) A material laminate in accordance with claim 1, wherein each bond site exhibits a smallest extension and a second extension which is perpendicular to the smallest extension, wherein at least the smallest extension in the bond sites of the first bond pattern is less than 0.8 millimetres.

5. (Amended) A material laminate in accordance with claim 4, wherein the smallest extension in the first bond pattern is 0.3 millimetres or less.

6. (Amended) A material laminate in accordance with claim 1, wherein the bond sites comprise spot-bonds.

7. (Amended) A material laminate in accordance with claim 1, wherein the first material layer is a hydrophobic nonwoven material.

8. (Amended) A material laminate in accordance with claim 1, wherein the second bond pattern is denser than the first bond pattern.

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9. (Amended) A material laminate in accordance with claim 1, wherein the material laminate is in the form of a coherent, continuous web and that the central portion and the side portions extend continuously in the length direction of the continuous web.

10. (Amended) An absorbent article exhibiting a substantially elongated shape with a length direction, a width direction and a thickness direction and exhibiting a central axis extending in the length direction and two opposing side edges extending in the length direction and comprising a fluid pervious covering sheet, a fluid impervious covering sheet and an absorption body enclosed between the two covering sheets, and wherein the absorbent article exhibits two side portions extending in the length direction and each extending in the width direction from a respective one of the side edges a distance towards the longitudinal central axis of the article and a central portion positioned between the side portions in the width direction of the article, wherein the fluid pervious covering sheet comprises a material laminate in accordance with claim 1, wherein the material laminate, in the central portion of the article exhibits the first bond pattern and the material laminate in the side portions of the absorbent article exhibits the second bond pattern.

11. (Amended) An absorbent article in accordance with claim 10, wherein the length extension of the side portions in the width direction of the article is at least 4 millimetres along all of the length of the each side portion.

Please add the following new claims 12 and 13:

--12. (New) A material laminate in accordance with claim 1, wherein the absorbent article is a sanitary napkin, an incontinence protector, or a diaper.

13. (New) An absorbent article in accordance with claim 10, wherein the second material layers is adjacent the absorption body.

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**REMARKS**

The foregoing amendments are made to place the claims in the preferred U.S. format and to remove multiple claim dependencies.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

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William C. Rowland  
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Date: January 7, 2002

2020-09-09 10:00:00



Application No. Unassigned  
Attorney's Docket No. 000515-280  
Page 1

Attachment to Preliminary Amendment dated January 7, 2002

**Marked-up Claims -**

1. (Amended) A material laminate for use as a covering sheet for an absorbent article [articles such as a sanitary napkin, an incontinence protector or a diaper] with [a planar extension,] a length direction, a width direction and a thickness direction and exhibiting a central axis extending in the length direction and two opposing side edges [(9,10)] extending in the length direction and comprising, in the thickness direction, a first fluid pervious material layer [(2)] and a second fluid pervious porous material layer wherein at least one of the material layers comprises a thermoplastic material and wherein the two material layers are mutually connected by bond sites in the material laminate [(1)] within which bond sites the thermoplastic material has been caused to at least partially soften or melt and thereby bond the two material layers together, and wherein the material laminate [(1), in the planar extension, further exhibits] includes two side portions [(5,6)] extending in the length direction and each extending a distance in the [transverse] width direction from a respective one of the side edges [edge (9,10)] towards the longitudinal central axis of the material laminate [(1)] and a central portion [(4)] positioned between the side portions [(5,6)] in the [planar extension] width extension of the material laminate [(1)] wherein the first material layer [(2)] and the second material layer [(3)] in the central portion [(4)] of the material laminate are intermittently bonded together in a first bond pattern [(7)] and the first material layer [(2)] and the second material layer [(3)] in the two side portions [(5,6)] of the material laminate are intermittently bonded together in a second bond pattern [(8), characterized in that] wherein the first fluid pervious material layer [(2)]

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**Attachment to Preliminary Amendment dated January 7, 2002**

**Marked-up Claims -**

is a fibrous layer arranged so that an outside surface of the material laminate is fibrous and  
[in that] the percentage of bonded area in relation to the total area in the two side portions  
[(5,6)] is greater then the percentage of bonded area in relation to the total area of the  
central portion [(4)].

2. (Amended) A material laminate in accordance with claim 1,  
[characterized in that] wherein the proportion of bonded area in relation to the total area in  
the central portion is at least 0.5% less than the proportion of bonded area in relation to the  
total area in the side portions.

3. (Amended) A material laminate in accordance with claim 1, [characterized  
in that] wherein the proportion of bonded area in relation to the total area in the central  
portion is between 3% and 6% and the proportion of bonded area in relation to the total  
area in the side portions is between 5% and 8%.

4. (Amended) A material laminate in accordance with [one of claims 1-3]  
claim 1, wherein each bond site exhibits a smallest extension and a second extension which  
is perpendicular to the smallest extension, [characterized in that] wherein at least the  
smallest extension in the bond sites of the first bond pattern is less than 0.8 millimetres.

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**Attachment to Preliminary Amendment dated January 7, 2002**

**Marked-up Claims -**

5. (Amended) A material laminate in accordance with claim 4,  
[characterized in that] wherein the smallest extension in the first bond pattern is 0.3  
millimetres or less.
6. (Amended) A material laminate in accordance with [one of claims 1-3]  
claim 1, [characterized in that] wherein the bond sites comprise spot-bonds.
7. (Amended) A material laminate in accordance with [one of the preceding  
claims] claim 1, [characterized in that] wherein the first material layer is a hydrophobic  
nonwoven material.
8. (Amended) A material laminate in accordance with [one of the preceding  
claims] claim 1, [characterized in that] wherein the second bond pattern is denser than the  
first bond pattern.
9. (Amended) A material laminate in accordance with [one of the preceding  
claims] claim 1, [characterized in that] wherein the material laminate is in the form of a  
coherent, continuous web and that the central portion [(4)] and the side portions [(5,6)]  
extend continuously in the length direction of the continuous web.

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**Attachment to Preliminary Amendment dated January 7, 2002**

**Marked-up Claims -**

10. (Amended) An absorbent article exhibiting a substantially elongated shape with [a planar extension,] a length direction, a width direction and a thickness direction and exhibiting a central axis extending in the length direction and two opposing side edges [(308,309; 408,409)] extending in the length direction and comprising a fluid pervious covering sheet [(301; 401)], a fluid impervious covering sheet [(313; 413)] and an absorption body [(315; 415)] enclosed between the two covering sheets [(301,313; 401,413)], and wherein the absorbent article[, in the planar extension,] exhibits two side portions [(305,306; 405,406)] extending in the length direction and each extending in the width [transverse] direction from a respective one of the side edges [edge (308,309; 408,409)] a distance towards the longitudinal central axis of the article and a central portion [(304; 404)] positioned between the side portions [(305,306; 405,406)] in the [planar extension] width direction of the article, [characterized in that] wherein the fluid pervious covering sheet [(301; 401)] comprises a material laminate [(1)] in accordance with [one of claims 1-9] claim 1, wherein the material laminate [(1)], in the central portion of the article exhibits the first bond pattern and the material laminate in the side portions of the absorbent article exhibits the second bond pattern.

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**Attachment to Preliminary Amendment dated January 7, 2002**

**Marked-up Claims -**

11. (Amended) An absorbent article in accordance with claim 10,  
[characterized in that] wherein the length extension of the side portions [(305,306;  
405,406)] in the width direction of the article is at least 4 millimetres along all of the  
length of the each side portion.

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A MATERIAL LAMINATE FOR USE AS A COVERING SHEET IN AN  
ABSORBENT ARTICLE.

5

TECHNICAL FIELD:

The present invention relates to a material laminate for use as a covering  
sheet for absorbent articles such as sanitary napkins, incontinence  
10 protectors, diapers, pant diapers, or the like. The material laminate  
comprises a first, fluid pervious fibrous material layer and a second fluid  
pervious porous material layer, wherein at least one of the two material  
layers comprises thermoplastic material and wherein the two material layers  
are mutually connected by means of the covering material laminate  
15 exhibiting bond sites within which the thermoplastic material has been  
caused to at least partially soften or melt and thereby bond the two material  
layers together. The invention also pertains to an absorbent article  
comprising the material laminate.

20 BACKGROUND OF THE INVENTION:

For fluid permeable covering sheets for absorbent articles of this kind, which  
in use are intended to be in contact with the body of a user, high demands  
are put on both softness and dryness.

25

However, it has proven difficult to accomplish a fluid permeable covering  
sheet having a soft, textile-like surface which remains dry even after  
repeated wetting when the covering sheet is being used on an absorbent  
article.

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It is known to use nonwoven materials in order to achieve a soft and smooth surface on an absorbent article. In order to obtain a dry surface closest to the skin of a user, it is also known to use hydrophobic nonwoven materials which have been perforated so as to create apertures in the material which are larger than the interstices between the fibres in the nonwoven material. Thereby, the fluid is passed through the perforated apertures, through the covering material and down to an underlying absorbent material layer.

In order to bond the covering sheet to an inside layer, it is common to use adhesive. However, the adhesives which are available at the present time are usually relatively hydrophobic, implying that fluid transfer from the covering sheet to the inside layer is hindered. When using a more hydrophilic adhesive, there is a risk that the adhesive will migrate into the hydrophobic nonwoven layer closest to the user which will cause the surface closest to the user to be perceived as wet after a first fluid insult. Another problem in connection with adhesively bonded material laminates wherein one of the layers are perforated is that the adhesive in the perforations may irritate the skin of the user during use. It is also a problem in the manufacture of the laminate that there is a risk that adhesive which happens to be applied in the perforations may be transferred to the transport band of the machine. A further problem in connection with absorbent articles exhibiting a perforated covering sheet which is adhered to an inner layer, is the risk of adhesive penetration when the articles are folded after manufacturing.

It is further known, for instance from EP 0,685,214 and EP 0,617,602 to bind together the covering sheet with an inside layer by melting the layers together in a bond pattern. In EP 0,617,602, a covering sheet consisting of a film is thermally bonded to an inside material layer by melting the layers together within specific bond areas. The bonds may, for instance, be circular bond sites.

However, it has been discovered that the covering sheet and the inside layer loose volume and thereby softness and skin friendliness by thermal bonding. Furthermore, the thermal bonds make the surface of the covering sheet more stiff and thereby less comfortable to carry in direct contact with skin. Since  
5 the bonds reduce the volume, i.e. the thickness, of the covering sheet and the inside layer, the distance between the absorption body of the article and the body of the user is also reduced. This means that the risk of fluid penetrating back out of the article and wetting the body of the user is increased. It has also been discovered that the thermal bonds affect the fluid  
10 uptake in the covering sheet closest to the user so that the surface closest to the user's body is perceived as being wet after a first fluid insult.

Another problem when using absorbent articles of the above-mentioned kind is that they are exposed to different kinds of mechanical stress. Accordingly,  
15 in order to minimise the risk that the constituting layers are separated from each other during use, it is important that the layers in the absorbent article are sufficiently strongly attached to each other.

Furthermore, the bonding should be such that the fluid transfer ability  
20 between the constituting layers is good, that the article exhibits low rewet and high softness and conformability.

#### DESCRIPTION OF THE INVENTION:

25 The problem with accomplishing an absorbent article which can withstand mechanical stress and at the same time exhibit a fluid pervious covering sheet which is soft and comfortable against skin and still exhibits high surface dryness has been substantially removed by the present invention.

30 A material laminate in accordance with the invention, for use as a fluid pervious covering sheet on absorbent articles such as, for instance, a



- sanitary napkin, an incontinence protector or a diaper is primarily distinguished in that the material laminate, in its planar extension, exhibits two side portions extending in the length direction and each extending a distance in the transverse direction from a side edge towards the longitudinal central axis of the material laminate and a central portion positioned between the side portions in the planar extension of the material laminate. The first material layer and the second material layer in the central portion of the material laminate are intermittently bonded together in a first bond pattern and the first material layer and the second material layer in the two side portions of the material laminate are intermittently bonded together in a second bond pattern. Further, the percentage bonded area in relation to the total area in the two side portions is greater than the percentage bonded area in relation to the total area of the central portion.
- The invention further concerns an absorbent article exhibiting a substantially elongated shape with a planar extension, a length direction, a width direction and a thickness direction and exhibiting a central axis extending in the length direction and two opposing side edges extending in the length direction. The absorbent article comprises a fluid pervious covering sheet, a fluid impervious covering sheet and an absorption body enclosed between the two covering sheets. The absorbent article comprises a material laminate in accordance with the previous description, wherein the material laminate, in a central portion extending in the length direction, exhibits the first bond pattern and the material laminate in the longitudinally extending side portions of the absorbent article exhibits the second bond pattern. In addition, the percentage bonded area in relation to the total area in the two side portions is greater than the percentage bonded area in relation to the total area in the central portion. The central portion extends in the length direction of the article over the whole of the length of the article and the two side portions extend in the length direction of the article over the whole of the length of the article.

With a covering sheet in accordance with the invention, it has shown to be considerably less risk of the two constituting layers separating from each other. Since the risk of the layers separating from each other is reduced, this also brings about a reduction of the risk of leakage. Another advantage with the invention is that the user's visual impression of the article is improved when the material layers are kept together along the longitudinal side edges of the article. The advantage with the surface closest to the user in the longitudinal central portion of the article not exhibiting as great a proportion of bonded area as the longitudinal side portions is that the covering sheet becomes softer and more comfortable to wear in contact with skin. A further advantage is that the risk of the central portion taking up liquid at the bond sites is considerably reduced.

In order to obtain the previously mentioned advantages with a covering sheet comprising a material laminate in accordance with the invention, the material laminate in accordance with a preferred embodiment exhibits a proportion of bonded area in relation to the total area in the central portion which is at least 0.5% less than the proportion of bonded area in relation to the total area in the side portions.

In accordance with one embodiment, the proportion of bonded area in the side portions is at least 3% but preferably more than 5%.

In accordance with another embodiment, the proportion of bonded area in relation to the total area in the central portion is between 3% and 6% and the proportion of bonded area in relation to the total area in the side portions is between 5% and 8%. This embodiment has been shown to be advantageous since the material layers both in the side portions and in the central portions should be sufficiently strongly attached to each other in order to keep air from intruding between the layers and lower the fluid transfer ability, but at

the same time the proportion of bonded area must not be so great so that the covering sheet will take up fluid at the bond sites to such an extent so as to make the surface feel wet after a first wetting. Particularly in the central portion, the proportion of bonded area is dependent on the thickness and the density of the material layers constituting the material laminate. For thin and dense material layers, the proportion of bonded area is preferably greater than for material layers, which are somewhat bulkier and thicker.

In accordance with one embodiment, both the first material layer and the second material layer are relatively thin. Preferably, the first material layer exhibits a basis weight of  $27 \text{ g/m}^2$  or less and the second material layer exhibits a basis weight of  $35 \text{ g/m}^2$  or less. The advantage with such an embodiment is that the materials closest to the bond sites only exhibit a densified structure to a very limited extent in comparison with the structure of the material layer outside of the area closest to the bond sites. This means that the tendency of the bond sites attracting fluid by capillary action is comparatively restricted.

In accordance with one embodiment, each bond site exhibits a smallest direction of extension and a second direction of extension which is perpendicular to the smallest direction of extension wherein the smallest direction of extension is less than 0.8 millimetres, at least in the first bond pattern. In accordance with a still more preferred embodiment, the smallest direction of extension is 0.3 millimetres or less, at least in the first bond pattern. The said embodiments are advantageous since it has been shown that when the bond sites exceed a certain size, the risk is greater that fluid will be taken up in the material laminate, in and around the bond sites. In order to achieve sufficient anchoring between the layers, i.e. avoid that air exists between the layers and diminishes the contact between them, it has further proven more advantageous to have a greater number of small bond sites than a smaller number of bond sites with a larger bond area.

The material laminate is preferably in the form of a coherent, continuous web wherein the central portion and the side portions extend continuously in the length direction of the continuous web. Such a material laminate is comparatively easy and rational to produce in a continuous process and may, further, be used as a covering sheet on an absorbent article without any particular synchronisation problems.

In accordance with a preferred embodiment, the first bond pattern extends over the full length of the article and also the second bond pattern over all of the length of the two side portions of the article. In such an embodiment, the proportion of bonded area in the central portion is the same over the full length of the article, i.e. the surface of the central portion of the covering sheet which in the plane of the article is situated closest to the transversely extending end edges of the article does also exhibit a smaller proportion of bonded area than the proportion of bonded area in the longitudinally extending side portions. The advantage with such an embodiment is that the manufacture of an absorbent article with such a covering sheet is simpler due to less synchronisation problems. Synchronisation in relation to the absorption body does only have to be made in the length direction of the absorption body. A further advantage is that, when bonding together the material laminate for use as a covering sheet for absorbent articles, the same patterned roller can be used for different sizes of the absorbent article.

In accordance with one embodiment, the side portions are 4 millimetres wide or more along all of the length of the article. Furthermore, the central portion exhibits the same width in the width direction over all of the length of the central portion. Since the crotch portion of the article is somewhat smaller in the width direction than the two end portions of the article, this implies that the side portions are narrowest in the crotch portion and are somewhat wider in the end portions of the article.

In accordance with one embodiment, the bond sites comprise spot bonds.

5 In accordance with another embodiment, the second bond pattern is more dense than the first bond pattern. This implies that the distance between the bond sites in the second bond pattern is smaller than the distance between the bond sites in the first bond pattern.

10 In accordance with one embodiment, both the first material layer and the second material layer are relatively thin. Preferably, the first material layer exhibits a basis weight of 27 g/m<sup>2</sup> or less and the second material layer exhibits a basis weight of 35 g/m<sup>2</sup> or less. The advantage with such an embodiment is that the materials closest by the bond sites only to a very limited extent exhibit a densified structure when compared to the structure of  
15 the material layer outside of the area closest to the bond sites. This means that the tendency of the bond sites attracting fluid by capillary action is comparatively restricted.

#### SHORT DESCRIPTION OF FIGURES:

20

Fig. 1 shows a planar view of a material laminate in accordance with the invention, with a first bond pattern.

Fig. 2 shows a second bond pattern.

25

Fig. 3 shows a sanitary napkin with a material laminate in accordance with the invention.

Fig. 4 shows an incontinence protector with a material laminate in  
30 accordance with the invention.

# DETAILED DESCRIPTION OF EMBODIMENTS:

The material laminate 1, which is shown in Fig. 1, comprises a first fluid pervious fibrous material layer 2 and a second fluid pervious porous material layer 3. At least the first material layer 2 but preferably both material layers 2,3 comprises thermoplastic material. Suitable thermoplastic materials are polyolefins such as polyethylene and polypropylene and polyamides, polyesters or the like. Further, different kinds of bicomponent fibres can be used. The two material layers 2,3 are mutually connected by bond sites in the material laminate 1 where the two material layers 2,3 have been compressed and the thermoplastic material has been at least partially softened and/or melted.

The material laminate 1 exhibits a planar extension, a length direction, a width direction and a thickness direction. The material laminate 1 exhibits a central axis extending in the length direction and two opposing longitudinal side edges 9,10 extending in the length direction. In the thickness direction, the material laminate comprises a first fluid pervious fibrous material layer 2 and a second fluid pervious porous material layer. A central portion 4 extends from the longitudinal central axis of the material laminate and a distance out towards each longitudinal side edge. Two longitudinal centre lines 11,12 delimit the central portion 4. A side portion 5,6 extends from each centre line 11,12 of the central portion 4, towards each of the longitudinal side edges 8,9 of the material laminate, respectively. The material layers 2,3 in the central portion 4 of the material laminate are intermittently bonded together in a first bond pattern 7 and the material layers 2,3 in the side portions 5,6 of the material laminate are intermittently bonded together in a second bond pattern 8. The percentage bonded area in relation to the total area in the two side portions 5,6 is greater than the percentage bonded area in relation to the total area of the central portion 4.

When the material laminate is used as a fluid pervious covering sheet on an absorbent article, the first material layer 2 is the layer on an absorbent article which is intended to be facing a user. For this reason, it is important that the first layer 2 has a smooth and soft surface. The first material layer 2  
5 suitably consists of a nonwoven material. Nonwoven materials may be produced by any one of a number of methods, for instance by carding or spinning of a fibrous web which is then bonded. Further, what is known as the meltblown method may be used to depose short fibres in the form of a fibrous web. Several different ways of binding the fibres in a nonwoven  
10 material exist. For instance, different kinds of bonding agents may be used. Furthermore, heat meltable components in the material may be used with ultrasonic bonding or with heating. Other bonding methods are needling and hydroentangling. In addition, different bonding methods may be combined with each other.

15

The second material layer 3 may also consist of a nonwoven material. When the material laminate is intended to be used as a fluid pervious covering sheet for a sanitary napkin, the second material layer 3 is suitably a nonwoven material with a higher degree of hydrophilicity than the first  
20 material layer 2. In such an article, the second material layer 3 will suitably act as a fluid dispersion layer, at the same time diminishing rewet from the absorption body under pressure.

When the material laminate is intended to be used as a fluid pervious  
25 covering sheet for an incontinence protector or a child's diaper, the second material layer 3 preferably has a greater thickness than the first material layer and is constituted of a porous and resilient fibre material. The second material layer 3 acts as a fluid transfer layer and should have the ability to acquire large amounts of fluid in a short time, spread the fluid in the plane of  
30 the material layer, transfer the fluid to an absorption body positioned beneath the material laminate and, in addition, be able to store fluid which

has not yet been absorbed by the absorption body. Particularly suitable materials for use in the second material layer are synthetic fibre wadding, carded, bonded or unbonded fibrous layers or relatively bulky nonwoven materials. Other types of suitable materials are porous hydrophilic foam materials. It is also conceivable that the second material layer consists of two or more layers of different or the same type of material.

The two material layers 2,3 are mutually bonded with a large number of bond sites 7,8. The bond sites have been formed by simultaneous compression and application of energy to the material laminate 1. Upon energy application, the thermoplastic material softens or melts at the bond sites 7,8 and thereby the two material layers 2,3 are bonded together. The bonding of the first and the second material layer 2,3 is carried out by heat bonding such as, for instance ultrasonic bonding or laser bonding. When cooling the molten or softened thermoplastic material in the laminate 1, the molten and/or softened material solidifies.

The material laminate 200 which is shown in Fig. 2 exhibits spot-shaped bond patterns. The material laminate 200 exhibits a first bond pattern 207 in the longitudinal central portion 204 of the article and a second bond pattern 208 in the longitudinal side portions 205,206 of the article. In the central portion 204 the spot-shaped bonds 204 in the bond pattern 207 are at a greater distance from each other than the spot-shaped bonds in the second bond pattern 208 in the two side portions 205,206. Naturally, the bond sites could have other shapes than those which have been shown in Figs. 1 and 2. When the bond sites consist of line-shaped bond areas, this means that the smallest extension of the bond site is considerably smaller than the second extension which is perpendicular to the smallest extension. The term line-shaped bond sites does also comprise curved bond sites. Further, the first bond pattern and the second bond pattern may have the same shape or alternatively exhibit different shapes. When the bond patterns have the



same shape, the bond sites in the first bond pattern are more sparsely distributed or alternatively each pattern unity in the first bond pattern is more sparsely distributed. It is also possible that each bond site in the first bond pattern occupies a smaller surface than each bond site in the second bond pattern. It is also possible, in the width direction of the material laminate, to have bond patterns exhibiting a greatest proportion of bonded area in relation to the proportion of non-bonded area closest to the longitudinal side edges of the material laminate, wherein the proportion of bonded area gradually diminishes in a direction toward the longitudinal central axis of the material laminate.

The sanitary napkin 300, shown in Fig 3 comprises a first fluid permeable covering sheet 301, in accordance with the invention, a fluid impermeable covering sheet 313, and an absorption body 315 enclosed between the covering sheets. The fluid impermeable covering sheet 313 may consist of a fluid impermeable plastic film, a nonwoven sheet which has been coated with a fluid barrier material, or some other flexible sheet of material which resists fluid penetration. It is generally advantageous if the fluid impermeable covering sheet has a certain degree of breathability, i.e. will permit the passage of water vapour. The two covering sheets 301,313 have a somewhat larger extension in the plane than the absorption body 315 and extend a distance past the edges of the absorption body 315, around the entirety of its periphery. The covering sheets 301,313 are joined to each other within the protruding portions, for instance by gluing, or by welding with heat or ultrasonically. It is also possible to perform the bonding of the protruding portions simultaneously with the bonding together of the first and second material layers 302,303 of the fluid pervious covering sheet.

The absorption core 315 is usually constructed of one or more layers of cellulose fibres, for instance fluffed cellulose pulp. An example of an absorbent structure which is suitable for the purpose is found in WO

94/10956, which publication describes an absorbent material which is cut from a web of material without preceding defibration and mat-forming steps. The material increases the surface dryness of the resulting article, which is a particular advantage when the fluid permeable covering sheet 301 has a  
5 textile sheet of material closest to the user.

In addition to cellulose fibres, the absorption core 315 may also contain superabsorbent material, i.e. material in the form of fibres, particles, granules, film or the like, which has the ability to absorb fluid corresponding  
10 to several times the weight of the superabsorbent material itself. The superabsorbent material binds the absorbed fluid and forms a fluid-containing gel. Further, the absorbent core 315 may contain binders, shape stabilising components, or the like. Additional absorption layers which improve the absorption properties may also be used, such as different types  
15 of wicking inserts, or material layers. The absorbent core 315 may be chemically or physically treated to alter the absorption properties. It is, for instance, common to arrange compressed areas in an absorption layer in order to control the fluid flow in the absorbent core. Moreover, other types of absorption materials may be utilised, alone or in combination with cellulose  
20 fibres and superabsorbent material. Some examples of useful absorbent materials are absorbent nonwoven materials, foam, or similar.

On the outside of the fluid impermeable covering sheet 313 is arranged a fastening means 317 in the form of two areas of self-adhesive glue. Before  
25 use, the adhesive areas 317 are preferably covered by removable protection sheets of release-coated paper, or plastic film, which are not shown in the drawing. A number of adhesive patterns other than the ones which are shown are, of course, conceivable, as well as other kinds of fastening means such as hook-and-loop surfaces, press-studs, girdles, special underpants, or  
30 the like. A sanitary napkin of the kind shown in Fig. 3 is attached inside an ordinary pair of underpants during use. The fastening means should

naturally be of a kind which permits removal of the sanitary napkin from the underpants without causing damage thereto.

The sanitary napkin 300 exhibits somewhat wider end portions 318, 319 and  
5 a somewhat narrower crotch portion 320 located between the end portions 318, 319. The crotch portion 320 is the portion of the sanitary napkin which is intended to be placed in the user's crotch during use and serve as a receiving surface for the body fluid which is discharged to the sanitary napkin.

10 Furthermore, the sanitary napkin exhibits two transversely extending end edges 322,324, and two longitudinally extending side edges 326,328, running between the end edges 322,324.

The sanitary napkin is further provided with fastening flaps 330,332, which  
15 are formed of the two covering sheets 301,313 and which extend from the side edges 326,328 of the sanitary napkin 300 at the crotch portion 320. The fastening flaps 330,332 are intended to be folded around the leg edges of the user's underpants during use of the sanitary napkin 300 and to be attached to the outside of the underpants. For this purpose, the fastening  
20 flaps 330,332 are provided with special fastening means 334, which may be chosen in the same way as the fastening means 317 on the fluid impermeable covering sheet 313. Naturally, the invention can also be applied to sanitary napkins which do not exhibit any protruding fastening  
25 flaps in the crotch portion, but an advantage with such an embodiment is that the second bond pattern extends in the width direction of the article along the whole length of the fastening flaps, whereby the width of the second bond pattern will not be less than in the article's two end portions.

The fluid permeable covering sheet 301 consists of a first layer of material  
30 302 and a second layer of material 303. The first layer of material 302 consists of a textile material, which is intended to be in contact with the body

of the user when the sanitary napkin is being used. The textile material may consist of a woven or knitted cloth but is preferably a spunbond-type nonwoven material. Further, the first layer of material 302 exhibits a plurality of penetrating apertures 336. Obviously, it is also possible that the first material layer 302 exhibit apertures of different sizes. An advantage with the first material layer exhibiting penetrating apertures 336 is that the material layer can be constituted by a hydrophobic nonwoven material which is not inherently fluid permeable. Such a first material layer will remain comparatively dry even after several wettings.

10

The apertures may, for instance be made by means of heated needles. A heat meltable material in the first material layer 302 can, in connection with the formation of the apertures 336 in the material layer, melt in the area closest to each aperture 336. When the melted material re-solidifies after the perforation process, it forms a substantially fluid impervious edge around the entire periphery of the aperture. The continuous edge increases the tensile strength of the covering sheet and prohibits fluid from wicking from the apertures out into the cover sheet 301. Instead, body fluids that strike the sanitary napkin 300 will pass down through the covering sheet 301 to the absorption body 315 which is positioned inside the covering sheet.

20

The second layer of material 303 of the fluid permeable covering sheet 301 is arranged inside the first layer of material 302. The second layer of material 303 preferably consists of a material which is more hydrophilic than the first layer of material 302, whereby fluid transport between the two material layers 302,303 will take place in a direction towards the absorption body 315 of the sanitary napkin. Some examples of suitable materials are different types of nonwoven materials, air-laid or wet-laid cellulose layers, wadding of different kinds, foam materials, or the like.

30

The two material layers 302,303 in the covering sheet 301 are bonded together in the same manner as the material layers 2,3 in the material laminate 1 which is described in Fig. 1. Accordingly, the covering sheet 301 exhibits a first bond pattern 307 in the longitudinal central portion 304 of the article and a second bond pattern 308 in the longitudinal side portions 305,306 of the article. The first bond pattern 307 consists of line-shaped bond sites wherein five or, alternatively, six bond sites together form a star-shaped unity. Accordingly, the first bond pattern 307 consists of a plurality of star-shaped unities. The second bond pattern 308 consists of a plurality of straight line-shaped bond sites extending in the width direction of the article. When the bond sites consist of an essentially straight line, it is an advantage if the extension of the bond sites in the length direction exhibits an angle to the length direction of the article. Hence, in this manner the material layers at the side edges of the article are more efficiently prohibited from separating from each other as compared to if the extension of the bond sites in the length dimension coincides with the length direction of the article.

The incontinence protector 400 which is shown in Fig. 4 comprises a covering sheet 401 which is constituted by a material laminate as previously described in Fig. 1. The incontinence protector 400 has substantially the same construction as the sanitary napkin in Fig. 3. The second material layer 403 of the fluid pervious covering sheet 401 is a fluid pervious fluid transfer layer. The fluid pervious covering sheet 401 encloses together with a fluid impervious covering sheet 413 an absorption body 415. The two covering sheets 401,413 have a somewhat greater planar extension than the absorption body 415 and extend a distance out beyond the edges of the absorption body. The covering sheets 401,413 are mutually connected within the protruding portions, for instance by adhesion or ultrasonic or heat welding.

As a non-limiting example of a material laminate in accordance with the invention can be mentioned a nonwoven material composed in accordance with the invention and consisting of a first material layer 402 of a nonwoven material of synthetic fibres and a second material layer 403 of a synthetic fibrous wadding.

The absorption body 415 is constructed similarly to the absorption body 315 described for the sanitary napkin in Fig. 3. Absorption bodies for incontinence protectors usually contain more superabsorbent material than absorbent bodies for sanitary napkins. The thin absorption bodies which are usual in children's diapers and incontinence protectors of today, often consist of a compressed blended or layered structure of cellulose fluff pulp and superabsorbent material.

In the same manner as for the sanitary napkin which is described in Fig. 3, a fastening device is arranged on the outside of the fluid barrier covering sheet 413, for instance in the form of two areas of self-adhesive glue. Before use, the adhesive areas 417 are suitably covered by removable protection sheets of release-coated paper, or plastic film, which are not shown in the drawing. A number of adhesive patterns other than the ones which have been shown are, of course, conceivable.

The incontinence protector 400 exhibits somewhat wider end portions 418,419 and a somewhat narrower crotch portion 420 situated between the end portions 418,419. The crotch portion 420 is the part of the incontinence protector which, during use, is intended to be placed in the crotch of the user and serve as receiving surface for the body fluid which is excreted to the incontinence protector.

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CLAIMS:

- 5 1. A material laminate for use as a covering sheet for absorbent articles  
such as a sanitary napkin, an incontinence protector or a diaper with a  
planar extension, a length direction, a width direction and a thickness  
direction and exhibiting a central axis extending in the length direction and  
two opposing side edges (9,10) extending in the length direction and  
10 comprising, in the thickness direction, a first fluid pervious material layer (2)  
and a second fluid pervious porous material layer wherein at least one of the  
material layers comprises thermoplastic material and wherein the two  
material layers are mutually connected by bond sites in the material  
saminete (1) within which bond sites the thermoplastic material has been  
15 caused to at least partially soften or melt and thereby bond the two material  
layers together, and wherein the material laminate (1), in the planar  
extension, further exhibits two side portions (5,6) extending in the length  
direction and each extending a distance in the transverse direction from a  
respective side edge (9,10) towards the longitudinal central axis of the  
20 material laminate (1) and a central portion (4) positioned between the side  
portions (5,6) in the planar extension of the material laminate (1) wherein the  
first material layer (2) and the second material layer (3) in the central portion  
(4) of the material laminate are intermittently bonded together in a first bond  
pattern (7) and the first material layer (2) and the second material layer (3) in  
25 the two side portions (5,6) of the material laminate are intermittently bonded  
together in a second bond pattern (8), characterized in that the first fluid  
pervious material layer (2) is a fibrous layer and in that the percentage of  
bonded area in relation to the total area in the two side portions (5,6) is  
greater then the percentage of bonded area in relation to the total area of  
30 the central portion (4).

AMENDED SHEET

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2. A material laminate in accordance with claim 1, **characterized in that** the proportion of bonded area in relation to the total area in the central portion is at least 0.5% less than the proportion of bonded area in relation to the total area in the side portions.

5

3. A material laminate in accordance with claim 1, **characterized in that** the proportion of bonded area in relation to the total area in the central portion is between 3% and 6% and the proportion of bonded area in relation to the total area in the side portions is between 5% and 8%.

10

4. A material laminate in accordance with one of claims 1-3, wherein each bond site exhibits a smallest extension and a second extension which is perpendicular to the smallest extension, **characterized in that at** least the smallest extension in the bond sites of the first bond pattern is less than 0.8 millimetres.

15

5. A material laminate in accordance with claim 4, **characterized in that** the smallest extension in the first bond pattern is 0.3 millimetres or less.

20

6. A material laminate in accordance with one of claims 1-3, **characterized in that** the bond sites comprise spot-bonds.

25 7. A material laminate in accordance with one of the preceding claims, **characterized in that** the first material layer is a hydrophobic nonwoven material.



8. A material laminate in accordance with one of the preceding claims, **characterized in that** the second bond pattern is denser than the first bond pattern.

5 9. A material laminate in accordance with one of the preceding claims, **characterized in that** the material laminate is in the form of a coherent, continuous web and that the central portion (4) and the side portions (5,6) extend continuously in the length direction of the continuous web.

10

10. An absorbent article exhibiting a substantially elongated shape with a planar extension, a length direction, a width direction and a thickness direction and exhibiting a central axis extending in the length direction and two opposing side edges (308,309; 408,409) extending in the length  
15 direction and comprising a fluid pervious covering sheet (301; 401), a fluid impervious covering sheet (313; 413) and an absorption body (315; 415) enclosed between the two covering sheets (301,313; 401,413), and wherein the absorbent article, in the planar extension, exhibits two side portions (305,306; 405,406) extending in the length direction and each extending in  
20 the transverse direction from a respective side edge (308,309; 408,409) a distance towards the longitudinal central axis of the article and a central portion (304; 404) positioned between the side portions (305,306; 405,406) in the planar extension of the article, **characterized in that** the fluid pervious covering sheet (301; 401) comprises a material laminate (1) in  
25 accordance with one of claims 1-9, wherein the material laminate (1), in the central portion of the article exhibits the first bond pattern and the material laminate in the side portions of the absorbent article exhibits the second bond pattern.

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11. An absorbent article in accordance with claim 10, characterized in that the length extension of the side portions (305,306; 405,406) in the width direction of the article is at least 4 millimetres along all of the length of the each side portion.

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ABSTRACT

5 The invention relates to a material laminate for use as a covering sheet on absorbent articles such as sanitary napkins, incontinence protectors, diapers, pant diapers, or the like. The material laminate comprises a first, fluid pervious fibrous material layer and a second fluid pervious porous material layer, wherein at least one of the two material layers comprises thermoplastic material and wherein the two material layers are mutually  
10 connected by means of the covering material laminate exhibiting bond sites within which the thermoplastic material has been caused to at least partially soften or melt and thereby bond the two material layers together. In the planar extension, the material laminate exhibits two side portions extending in the length direction and having an extension in the width direction from a  
15 respective longitudinal side edge and a distance in towards the longitudinal central axis of the material laminate and a central portion positioned between the side portions in the planar extension of the material laminate, wherein the first material layer and the second material layer in the central portion of the material laminate are intermittently bonded together with a first  
20 bond pattern and that the first material layer and the second material layer in the two side portions of the material laminate are intermittently bonded together with a second bond pattern wherein the percentage bonded area in relation to the total area in the two side portions is greater then the percentage bonded area in relation to the total area in the central portion.

25 The invention further pertains to an absorbent article comprising the material laminate.

(Fig. 1)

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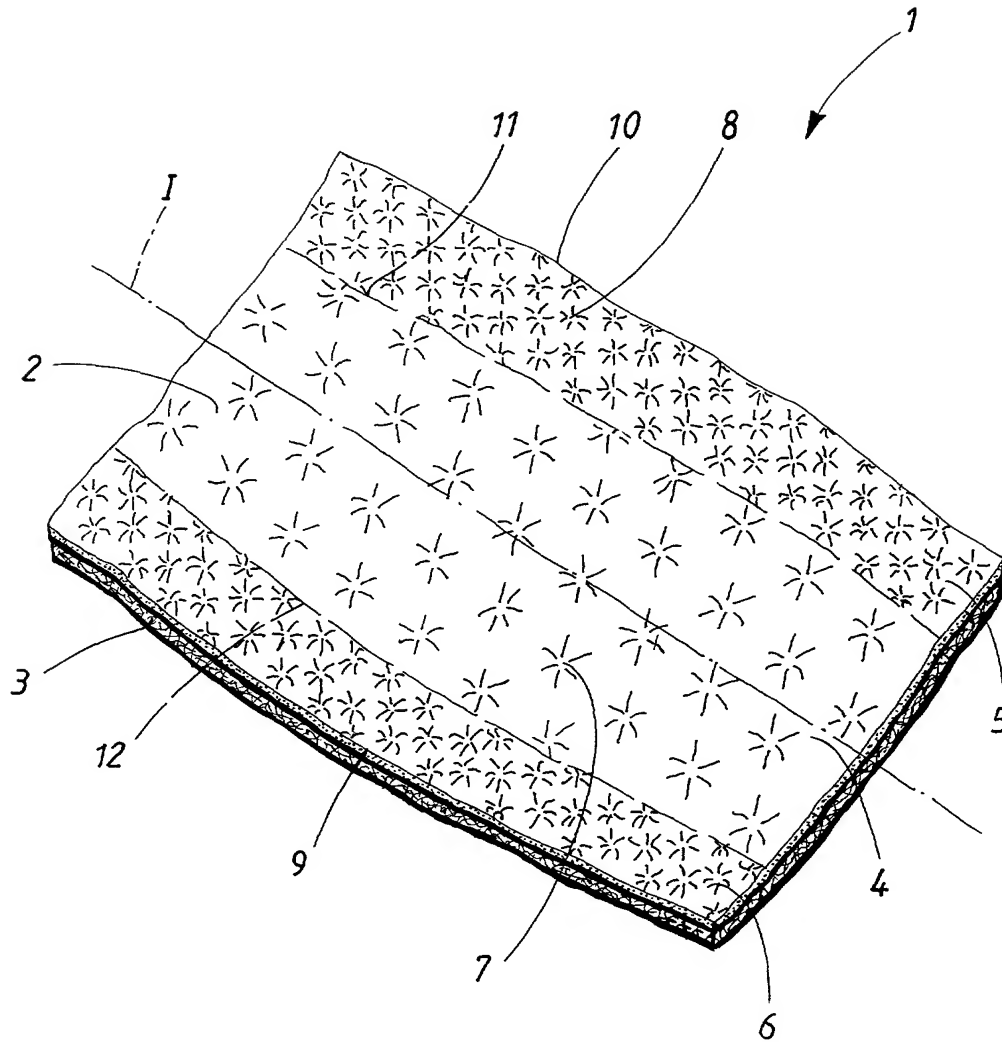


FIG. 1

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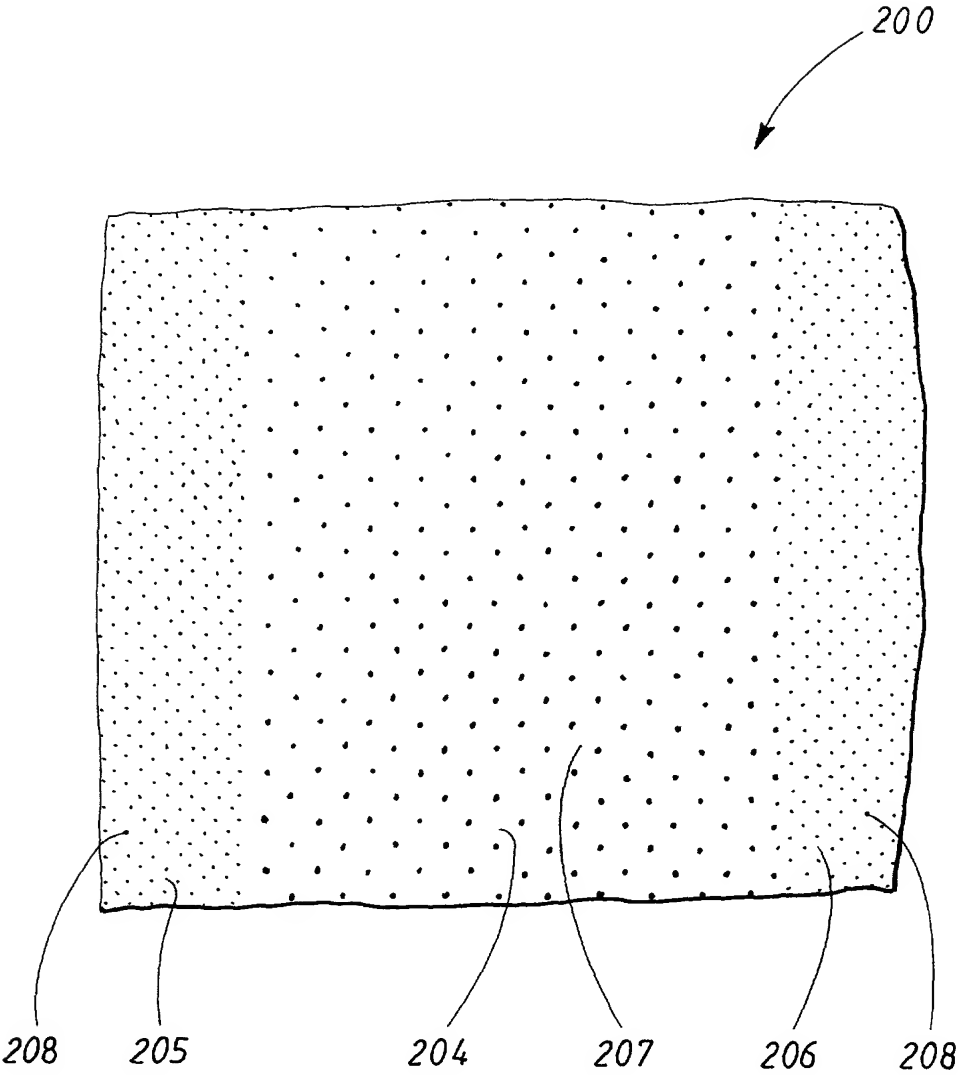


FIG. 2

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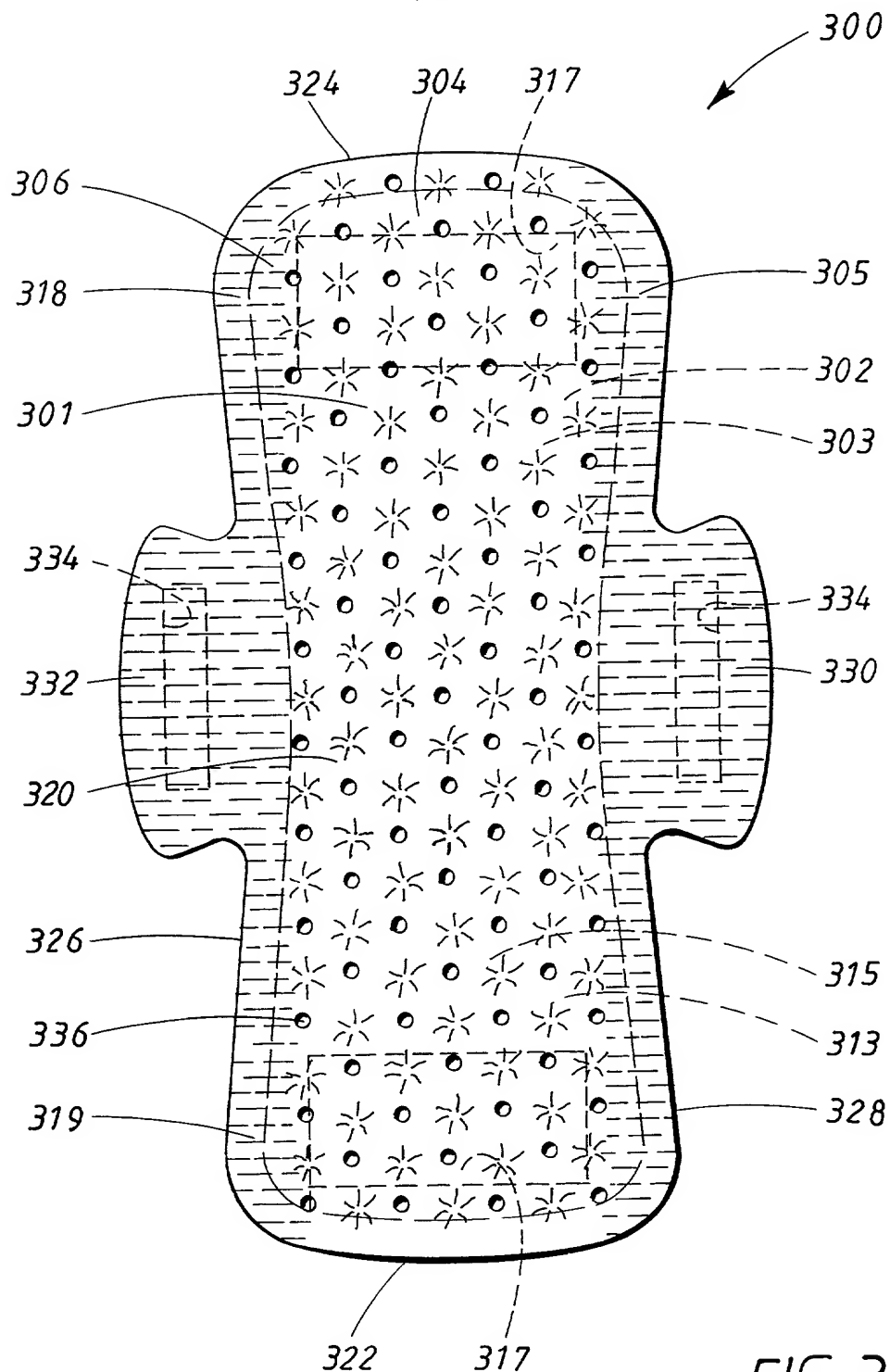


FIG. 3

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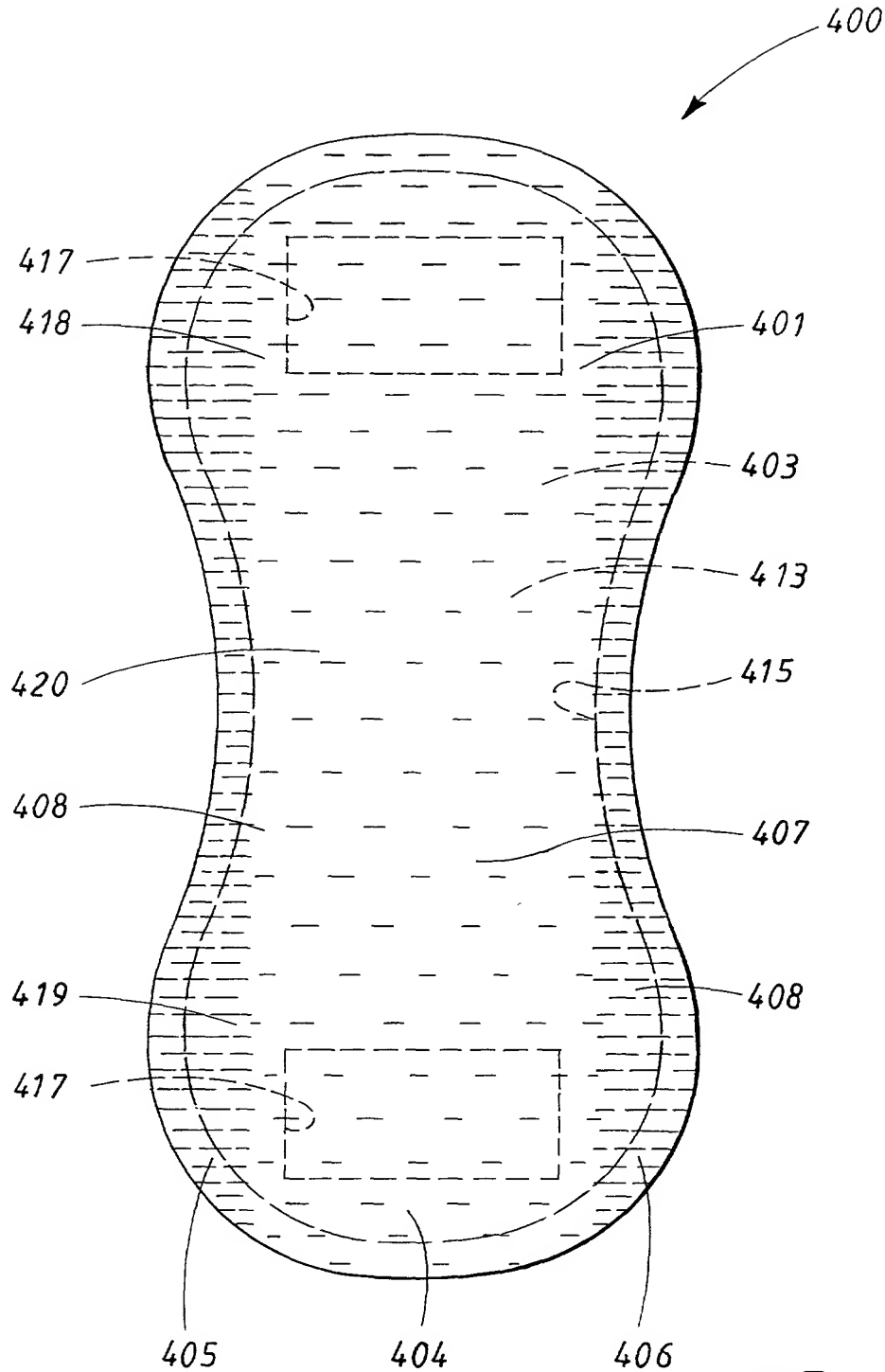


FIG. 4

**COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY**  
(Includes Reference to Provisional and PCT International Applications)

ATTORNEY'S DOCKET NUMBER

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

A material laminate for use as a covering sheet in an absorbent article.

the specification of which (check only one item below):

☐ is attached hereto.

☐ was filed as United States application

Number \_\_\_\_\_

on \_\_\_\_\_

and was amended

on \_\_\_\_\_ (if applicable).

☒ was filed as PCT international application

Number PCT/SE00/01405

on 3 July 2000

and was amended ~~under PCT Article 19~~

on 5 July 2001 (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §§ 119 (a)-(e) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

**PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119:**

COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. § 119
SE	9902647-8	9 July 1999	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below.

\_\_\_\_\_  
(Application Number)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Application Number)

\_\_\_\_\_  
(Filing Date)



**COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (CONTINUED)**  
(Includes Reference to Provisional and PCT International Applications)

ATTORNEY'S DOCKET NO.

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose to the Office all information known to me to be material to the patentability as defined in Title 37, Code of Federal Regulations § 1.56, which became available between the filing date of the prior application(s) and the national or PCT international filing date of this application:

**PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. § 120:**

U.S. APPLICATIONS		STATUS (check one)		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
PCT APPLICATIONS DESIGNATING THE U.S.				
PCT APPLICATION NO.	PCT FILING DATE	U.S. APPLICATION NUMBERS ASSIGNED (if any)		

I hereby appoint the following attorneys and agent(s) to prosecute said application and to transact all business in the Patent and Trademark Office connected therewith and to file, prosecute and to transact all business in connection with international applications directed to said invention:

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Ronald L. Grudziecki	24,970	Teresa Stanek Rea	30,427	Charles F. Wieland III	33,096
Frederick G. Michaud, Jr.	26,003	Robert E. Krebs	25,885	Bruce T. Wieder	33,815
Alan E. Kopecki	25,813	William C. Rowland	30,888	Todd R. Walters	34,040
Regis E. Slutter	26,999	T. Gene Dillahunt	25,423	Ronni S. Jillions	31,979
Samuel C. Miller, III	27,360	Patrick C. Keane	32,858	Harold R. Brown III	36,341
Ralph L. Freeland, Jr.	16,110	Bruce J. Boggs, Jr.	32,344	Allen R. Baum	36,086
Robert G. Mukai	28,531	William H. Benz	25,952	Steven M. duBois	35,023

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and:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (CONTINUED) (Includes Reference to Provisional and PCT International Applications)		ATTORNEY'S DOCKET NO.
FULL NAME OF SOLE OR FIRST INVENTOR Bror-Inge HELMFRIDSSON <span style="float: right;">100</span>		SIGNATURE <span style="float: right;">10 Jan. 2002</span> 
RESIDENCE Partille, Sweden <span style="float: right;">SEX</span>		CITIZENSHIP Swedish
POST OFFICE ADDRESS Råvekarrevägen 4, S-433 50 PARTILLE, Sweden		
FULL NAME OF SECOND JOINT INVENTOR, IF ANY Urban NILSSON <span style="float: right;">200</span>		SIGNATURE <span style="float: right;">10 Jan. 2002</span> 
RESIDENCE Kungälv, Sweden <span style="float: right;">SEX</span>		CITIZENSHIP Swedish
POST OFFICE ADDRESS Pl. 3972 Veneröd, S-442 95 KUNGÄLV, Sweden		
FULL NAME OF THIRD JOINT INVENTOR, IF ANY Stefan LINDGREN <span style="float: right;">300</span>		SIGNATURE <span style="float: right;">10 Jan. 2002</span> 
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FULL NAME OF FOURTH JOINT INVENTOR, IF ANY		SIGNATURE <span style="float: right;">DATE</span>
RESIDENCE		CITIZENSHIP
POST OFFICE ADDRESS		
FULL NAME OF FIFTH JOINT INVENTOR, IF ANY		SIGNATURE <span style="float: right;">DATE</span>
RESIDENCE		CITIZENSHIP
POST OFFICE ADDRESS		
FULL NAME OF SIXTH JOINT INVENTOR, IF ANY		SIGNATURE <span style="float: right;">DATE</span>
RESIDENCE		CITIZENSHIP
POST OFFICE ADDRESS		
FULL NAME OF SEVENTH JOINT INVENTOR, IF ANY		SIGNATURE <span style="float: right;">DATE</span>
RESIDENCE		CITIZENSHIP
POST OFFICE ADDRESS		
FULL NAME OF EIGHTH JOINT INVENTOR, IF ANY		SIGNATURE <span style="float: right;">DATE</span>
RESIDENCE		CITIZENSHIP
POST OFFICE ADDRESS		
FULL NAME OF NINTH JOINT INVENTOR, IF ANY		SIGNATURE <span style="float: right;">DATE</span>
RESIDENCE		CITIZENSHIP
POST OFFICE ADDRESS		